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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,324	05/18/2007	Guillaume Bouche	S1022.81158US00	5686

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EXAMINER	
AHMED, SELIM U	

ART UNIT	PAPER NUMBER
2826	

NOTIFICATION DATE	DELIVERY MODE
07/08/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/580,324	BOUCHE, GUILLAUME	
	Examiner	Art Unit	
	SELIM AHMED	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 March 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *29-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *29-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 May 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's response filed on 03/12/2010 is acknowledged. Applicants have canceled claims 1-28 and added new claims 29-50. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 29-50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claim 29, the claim recites the limitation "the membrane" in lines 9 and 14 respectively. There is insufficient antecedent basis for this limitation in the claim. It appears that "the membrane" should be "the flexible membrane".

With regard to claim 49, the claim recites the limitation "the membrane" in line 2. There is insufficient antecedent basis for this limitation in the claim. It appears that "the membrane" should be "the flexible membrane".

With regard to claim 43, the claim recites the limitation "the chip" in line 4. There is insufficient antecedent basis for this limitation in the claim. It appears that "the chip" should be "the integrated circuit chip".

The corresponding dependent claims inherit the deficiency.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 29-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cabuz et al (US 6,837,476; Cabuz hereinafter) in view of Benzel et al (US 2003/0116813; Benzel hereinafter).

With regard to claim 29, Cabuz discloses an integrated circuit chip (e.g. Fig. 1) comprising: a pump 5 in fluid communication with a ventilating (functional limitation) duct 44a or 44b and configured to cool the chip (functional limitation), the pump 5 comprising: a cavity 12 disposed on the semiconductor substrate 10 (Col.6, lines 18-40; Fig.1 can be upside down to meet the claim limitation cavity being on the semiconductor substrate); a conductive layer 30 covering at least a

portion of an interior of the cavity 12; a flexible membrane 20, including a conductive material (col.6, lines 41-42), placed above the cavity 12; a dielectric layer (col.6, lines 51-56) that provides insulation between portions of the conductive layer 30 and the conductive material of the membrane 20 which are close to each other; a pumping volume (Fig.1, element 30 and 20 define the volume) defined between the conductive layer 30 and the flexible membrane 20; at least one opening 44a that provides fluid communication to the pumping volume through the conductive layer 30; terminals (col.1, lines 52-60) to receive and apply voltage between the conductive layer 30 and the membrane 20 to cause the flexible membrane to move (e.g. Figs. 11 & 12); and wherein the flexible membrane 20 is configured to cover the at least one opening 44a upon application of the voltage (e.g. Fig. 15).

As discussed above, Cabuz discloses all of the limitations of claim 29 with the exception of the semiconductor substrate comprising at least one transistor. However, e.g. para[0067] of Benzel discloses a semiconductor substrate 10 comprising at least one transistor (para[0067]. According to para[0067] of Benzel, the flow channel 50a that carries a coolant liquid or coolant gas or another coolant so that the power components (transistors) may be cooled from the back with good thermal contact and compared with cooling from the front, this would have the advantage that it might not be necessary to protect the surface from the coolant. So, it would have been obvious to one having ordinary skill in the art at

the time of the invention to substitute Benzel's semiconductor substrate with at least one transistor with Cabuz's substrate and results would have been predictable.

The applicant's claim 29 does not distinguish over the Cabuz in view of Benzel reference regardless of the functions allegedly performed by the claimed device, because only the device per se is relevant, not the recited function of "ventilating" and "configured to cool the chip". Note that functional language in a device claim is directed to the device per se, no matter which of the device's functions is referred to in the claim. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) ("[A]pparatus claims cover what a device *is*, not what a device *does*" [emphasis in original]); *In re King*, 231 USPQ 136 (Fed. Cir, 1986) ("It did not suffice merely to assert that [the cited prior art] does not inherently achieve [the claimed function], challenging the PTO to prove the contrary by experiment or otherwise. The USPTO is not equipped to perform such tasks"); *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977) (claiming a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable); and *Ex parte* Smith, 83 USPQ2d 1509, 1514 (Bd. Pat. App. & Int. 2007) ("Where, as here, the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the USPTO can require an applicant to prove that the prior art

products do not necessarily or inherently possess the characteristics of his claimed product"). See MPEP § 2114. In this case, it is reasonable to assume that Cabuz's device is capable of "ventilating" because 44a, 44b are outlet ports and capable of "configured to cool the chip" through heat transfer as fluid flows from inlet to outlet. Because it is reasonable to assume that assume that Cabuz's device is capable of performing the claimed function, the burden shifts to Applicants to show that it is not. See MPEP § 2114.

With regard to claim 30, e.g. Fig. 11 of Cabuz discloses the integrated circuit chip of claim 1, wherein the cavity 114 has a cup shape so that the interval between the conductive layer 30 and the membrane 20 progressively increases from a border, formed between the cavity 12 and an upper surface of the substrate 10, to a bottom of the cavity 114.

With regard to claim 31, e.g. Fig. 7, element 94 of Cabuz discloses the integrated circuit chip of claim 1, wherein the first opening 94 is positioned one substantially at the bottom of the cavity 86.

With regard to claim 32, e.g. Fig.5 of Bonzel discloses the integrated circuit chip of claim 29, further comprising a ventilating duct 510 formed at least partially in the semiconductor substrate 10 of the integrated circuit (para[0067])

and that leads to the at least one opening 520. (Please note that Fig.1 of Cabuz also discloses the limitations).

With regard to claim 33, e.g. col.6, lines 51-55 of Cabuz discloses the integrated circuit chip of claim 29, wherein the dielectric layer is positioned on the conductive layer 130.

With regard to claim 34, e.g. col.6, line 51-55 of Cabuz discloses the integrated circuit chip of claim 29, wherein the dielectric layer is positioned on the flexible membrane 120.

With regard to claim 35, e.g. col. 6, lines 41 of Cabuz discloses the integrated circuit chip of claim 29, wherein the flexible membrane is formed of a conductive material.

With regard to claim 36, e.g. Fig. 1 of Cabuz discloses the integrated circuit chip of claim 29, wherein the at least one opening comprises a first opening 44a and a second opening 44b, each opening providing fluid communication to the pumping volume through the conductive layer (since outlet ports, they provide fluid communication. Furthermore, the limitations are functional).

With regard to claim 37, e.g. Fig. 11 of Cabuz discloses the integrated circuit chip of claim 29, further comprising a first ventilating duct (part of 122 within substrate 112) formed at least in part in the semiconductor substrate 112 of the integrated circuit and that leads to the first opening 122 and a second ventilating duct 124 (part of the larger opening across from 122 or 124 within substrate) formed at least in part in the semiconductor substrate 112 and that leads to the second opening 124. Please note that Fig.5 of Benzel also discloses the claim limitation.

With regard to claim 38, e.g. Fig. 12 of Cabuz discloses the integrated circuit chip of claim 36, wherein application of the voltage to the terminals causes the flexible membrane to move toward the conductive layer to close fluid communication between the second opening and the pumping volume. Furthermore, the limitations are functional and Cabuz device is capable of meeting the limitations.

With regard to claim 39, e.g. Fig. 1 of Cabuz discloses the integrated circuit chip of claim 36, wherein the second opening 44b is positioned closer to a border (the border which is closer) of the cavity 12 than the first opening 44a is positioned to the border, the border being between the cavity 12 and an upper surface of the substrate 10.

With regard to claims 40 and 41, the applicant's claims do not distinguish over the Cabuz reference regardless of the functions allegedly performed by the claimed device, because only the device per se is relevant, not the recited function such as, "application of a sufficient voltage between the conductive layer and the membrane, the flexible membrane is adapted to cover the second opening and not the first opening" or "the flexible membrane is configured to cover at least the second opening when the voltage is applied". Note that functional language in a device claim is directed to the device per se, no matter which of the device's functions is referred to in the claim. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) ("[A]pparatus claims cover what a device *is*, not what a device *does*" [emphasis in original]); *In re King*, 231 USPQ 136 (Fed. Cir, 1986) ("It did not suffice merely to assert that [the cited prior art] does not inherently achieve [the claimed function], challenging the PTO to prove the contrary by experiment or otherwise. The PTO is not equipped to perform such tasks"); *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977) (claiming a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable); and *Ex parte* Smith, 83 USPQ2d 1509, 1514 (Bd. Pat. App. & Int. 2007) ("Where, as here, the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics

of his claimed product"). See MPEP § 2114. In this case, it is reasonable to assume that Cabuz's device is capable of meeting the functional limitations, because Cabuz discloses a device that is apparently identical to the device Applicant claims as being capable of performing the functional limitations. Because it is reasonable to assume that Cabuz's device is capable of performing the claimed function, the burden shifts to Applicants to show that it is not. See MPEP § 2114.

With regard to claim 42, Cabuz discloses the the claimed invention but does not explicitly disclose the second opening is larger than the first opening to promote the introduction of more air through the second opening than the first opening to the pumping volume when the voltage is reduced. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the size of the openings, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. See also In re Peterson, 65 USPQ2d 1379.

4. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al (US 5,901,037; Hamilton hereinafter) in view of Benzel.

With regard to claim 43, Hamilton discloses integrated circuit chip (e.g. Figs. 10 &11) comprising: a semiconductor substrate 14 (e.g. silicon) comprising at least one transistor 12 and at least one ventilating duct 19, 21; and a pump 28' configured to cool the chip (Even though "configured to cool the chip" found to be functional, this limitation met by Hamilton-Abstract), the pump 28' being disposed on the semiconductor substrate 14 and in fluid communication with the at least one ventilating duct 19,21 (Fig.11).

As discussed above, Hamilton discloses all of the limitations but does not explicitly disclose the semiconductor substrate 14 comprising at least one transistor. Hamilton discloses transistor dies 12 on the semiconductor substrate 14. However, semiconductor substrate comprising at least one transistor is common knowledge in the art as semiconductor substrate comprises million of transistors. For example, para[0067] of Benzel discloses a semiconductor substrate 10 comprising at least one transistor (para[0067]. According to para[0067] of Benzel, the flow channel 50a that carries a coolant liquid or coolant gas or another coolant so that the power components (transistors) may be cooled from the back with good thermal contact and compared with cooling from the front, this would have the advantage that it might not be necessary to protect the surface from the coolant. So, it would have been obvious to one having ordinary skill in the art at the time of the invention to substitute Benzel's semiconductor

substrate with at least one transistor with Hamilton's substrate and results would have been predictable.

5. Claims 44-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al (US 5,901,037; Hamilton hereinafter) in view of Benzel and further in view of Cabuz.

With regard to claim 44, Hamilton in view of Benzel discloses all of the limitations with the exception of wherein the pump comprises a cavity disposed on the semiconductor substrate. However, e.g. Fig.1 of Cabuz discloses the pump 5 comprises a cavity 12 disposed on the semiconductor substrate 10 (Col.6, lines 18-40; Fig.1 can be upside down to meet the claim limitation of cavity being on the semiconductor substrate). In col.1, lines 32-35 of Cabuz discloses, "The present invention provides an electrostatically actuated valve that is relatively small, has relatively low fabrication costs, and consumes relatively low voltage and/or power". So, it would have been obvious to one having ordinary skill in the art at the time of the invention to substitute Cabuz's pump comprises a cavity disposed on the semiconductor substrate within Hamilton's device and results would have been predictable.

With regard to claim 45, e.g.Fig.1 of Cabuz discloses the integrated circuit chip of claim 44, wherein the pump 5 comprises a conductive layer 30 covering at least a portion of an interior of the cavity 12.

With regard to claim 46, e.g. Fig.1 of Cabuz discloses the integrated circuit chip of claim 45, further comprising at least one opening 44a that provides fluid communication between the at least one ventilating duct 44a and the pump through the conductive layer 30.

With regard to claim 47, e.g. Fig.1 of Cabuz discloses the integrated circuit chip of claim 44, wherein the pump 5 comprises a flexible membrane 20 that includes a conductive material, wherein the flexible membrane 20 is disposed above the cavity 12.

With regard to claim 48, e.g. Fig.1, of Cabuz discloses the integrated circuit chip of claim 47, wherein the pump 5 comprises a dielectric layer (col.6, lines 51-56) that provides insulation between portions of a conductive layer 30 and the conductive material of the flexible membrane 20, the conductive layer 30 and the conductive material being in close proximity to one another.

With regard to claim 49, e.g. Fig.1 of Cabuz discloses the integrated circuit chip of claim 48, wherein the pump 5 comprises terminals (col.1, lines 52-60) to

receive and apply voltage between the conductive layer 30 and the membrane 20 to cause the flexible membrane to move (e.g. Figs. 11 &12).

With regard to claim 50, e.g. Fig.1 of Cabuz discloses the integrated circuit chip of claim 49, wherein the flexible membrane 20 is configured to cover at least one opening 44a in the conductive layer that provides fluid communication between the pump 5 and the at least one ventilating duct upon application of the voltage (e.g. Fig.15).

Response to Arguments

6. Applicant's arguments with respect to claims 29-50 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory

period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SELIM AHMED whose telephone number is (571)270-5025. The examiner can normally be reached on 9:00 AM-6:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571) 272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service

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/SA/

/Sue A. Purvis/
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